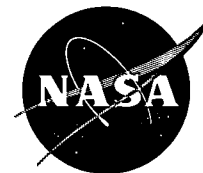


NASA TECH BRIEF



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Dynamic Balancing of High-Speed Rotary Machinery

A description is available of a Rotary Dynamics Test Facility that can investigate and correct imbalances in virtually all types of rotary components and machinery at speeds up to 60,000 rpm; it can handle propellers of 10-ft diameter and turbine assemblies as long as 8 ft. Critical frequencies and vibration phenomena can now be studied well beyond the ranges of earlier techniques and equipment; hitherto many rotary parts have been balanced at no more than 10% of their working speeds. Previously balance could be studied from only radial reactions of bearings at two points; now imbalance can be determined anywhere along a rotating axis.

The most modern equipment and techniques have been incorporated for investigation, under normal operating conditions, of the dynamic responses introduced by such variables as nonlinear flexible bearings, asymmetric flexible housings, flexible shafts, dynamic loading of inlet and outlet ducting, and motor imbalances in various planes and angular orientations.

Use of a vacuum chamber (diameter, 14 ft; height, 10 ft; 4 mm-Hg, absolute) eliminates the effect of windage and facilitates the chilling of test pieces. The test area is $20 \times 40 \times 12$ ft in width, length, and depth below ground.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Headquarters
National Aeronautics
and Space Administration
Washington, D.C. 20546
Reference: TSP70-10433

Source: E. J. Bodensieck and Stefan Pronasko of
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